



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/742,882	12/20/2000	Hiroki Nakahara	9319S-000170	8241

7590 06/06/2003
Harness, Dickey & Pierce, P.L.C.
P.O. Box 828
Bloomfield Hills, MI 48303

EXAMINER

AKKAPEDDI, PRASAD R

ART UNIT PAPER NUMBER

2871

DATE MAILED: 06/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/742,882

Applicant(s)

NAKAHARA, HIROKI

Examiner

Prasad R Akkapeddi

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Response to Arguments

2. Applicant's arguments filed on 02/28/2003 have been fully considered but they are not persuasive.
3. The original 35 USC 112 rejections for claims 1, 4-6 are hereby withdrawn due to the amendments.
4. Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuda et al. (Tsuda) (JP 11-002820), applicant's cited reference..

a. As to claims 1 and 10: Tsuda discloses a liquid crystal device having a first substrate (1) and a second substrate (3) which have electrodes (4, 10) and alignment layers (2, 5) formed on surfaces thereof and are attached to each other with a liquid crystal (11) sealed having a first conductive member (10) formed on a surface of a peripheral portion of the first substrate (1), a second conductive member (4) formed on a portion on the second substrate (3) that opposes the first conductive member (10) and a vertical conducting portion having a conductive material (9) containing conductive particles (6) for conductive connection between the first conductive member (10) and the second conductive member (4), wherein the alignment layer (5) is formed such that it extends to cover the surface of at least one of the first conductive member (4) and the second conductive member (10) and the conductive particles (6) extend through the alignment layer (pierce, abstract, line 14) to be in conductive contact with the first conductive member (4) and the second conductive member (10). As to the newly recited feature that the 'conductive particles having an outside

diameter that is 5 to 205 larger than an outside diameter of the non-conductive spacers', it can be seen from Fig. 1 of Tsuda that the diameter of the conductive member (6) is larger than the spacer (7). Also, please see the response by the examiner to argument No. 1 below. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the diameter of the conductive member larger than the spacer so that conductive spacers pierce the orientation film to connect an external connection terminal to the TFT substrate and the transparent electrode on the opposite substrate to each other.

7. Claims 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuda.

As to claims 4 and 8: Tsuda discloses a liquid crystal device having a first substrate (1) and a second substrate (3) which have electrodes (4, 10) and alignment layers (2, 5) formed on surfaces thereof and are attached to each other with a liquid crystal (11) sealed having a first conductive member (10) formed on a surface of a peripheral portion of the first substrate (1), a second conductive member (4) formed on a portion on the second substrate (3) that opposes the first conductive member (10) and a vertical conducting portion having a conductive material (9) containing conductive particles (6) for conductive connection between the first conductive member (10) and the second conductive member (4), wherein the alignment layer (5) is formed such that it extends to cover the surface of at least one of the first conductive member (4)

and the second conductive member (10) and the conductive particles (6) extend through the alignment layer (pierce, abstract, line 14) to be in conductive contact with the first conductive member (4) and the second conductive member (10).

Tsuda discloses that the alignment layer is having a thickness of about 1000 angstroms (see the page 3, paragraph 0017).

Note that the range for the thickness of the alignment layer as disclosed by Tsuda is in the range of about 100 to 400 angstroms (asserted in claim 4). Therefore, the range in claim 4 would have at least been obvious. See In re Malagari, 499 F.2d 197, 182 USPQ 549 (CCPA 1974).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the Tsuda device with the thickness of 100 to 400 angstroms to obtain a better electrical connection between the electrode and the terminal.

8. Claims 2, 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuda in view of Yamagishi et al. (Yamagishi) (U.S. Patent No. 6,466,294).

b. As to claims 2, 3 and 7: Although Tsuda discloses that the alignment layer (5) covers at least one of the first conductive member (10) and the second conductive member (4) is formed on an entire surface of an area of a substrate surface where the first substrate (1) and the second substrate (4) oppose each other, Tsuda does not explicitly disclose that the alignment layer does not cover the place where the conductive particles are disposed. Yamagishi on the other hand, in disclosing a similar liquid crystal display device discloses that the

alignment layer (7) does not cover the place where the conductive particles (9) are disposed (Fig. 6) (Col. 7, lines 6-7). Yamagishi also discloses that the conductive particles (9) are in the sealing adhesive (Col. 7, lines 8-9) (Fig. 6), thus making the conductive material as a sealing material for sealing a liquid crystal (4) between the first substrate (1) and the second substrate (2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the conductive sealer as disclosed by Yamagishi to the liquid crystal device disclosed by Tsuda for maximizing the screen size and offer liquid crystal display panels having narrow frame.

9. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuda .

As to claims 5 and 6: A method claim should consist of a series of steps necessary to fabricate the device. The recitation in claim 5 does not contain any specific method steps (except in some generalities) and as such it is not clear how this device could be fabricated. However, Tsuda discloses a liquid crystal device having a first substrate (1) and a second substrate (3) which have electrodes (4, 10) and alignment layers (2, 5) formed on surfaces thereof and are attached to each other with a liquid crystal (11) sealed having a first conductive member (10) formed on a surface of a peripheral portion of the first substrate (1), a second conductive member (4) formed on a portion on the second substrate (3) that opposes the first conductive member (10) and a vertical conducting portion having a conductive material (9) containing conductive particles (6) for

conductive connection between the first conductive member (10) and the second conductive member (4), wherein the alignment layer (5) is formed such that it extends to cover the surface of at least one of the first conductive member (4) and the second conductive member (10) and the conductive particles (6) extend through the alignment layer (pierce, abstract, line 14) to be in conductive contact with the first conductive member (4) and the second conductive member (10).

Tsuda also discloses that the first substrate (1) and the second substrate (3) are attached to each other (Fig. 1) via the conductive material (6) and pressure (compression-bonding) (abstract, line 13) is applied thereby causing the conductive particles to break through the alignment layers (2, 5) to be in electrically conductive contact with the first conductive member (10) and the second conductive member (4). Tsuda also discloses that the alignment layers (2, 5) are formed on an entire area of the surface of the first substrate (1) and the second substrate (3) which oppose each other (Fig. 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the diameter of the conductive member larger than the spacer so that conductive spacers pierce the orientation film to connect an external connection terminal to the TFT substrate and the transparent electrode on the opposite substrate to each other.

10. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuda in view of Yamagishi.

c. Tsuda does not explicitly state that the conductive material is a sealing material. Yamagishi in discloses a liquid crystal display device using sealing adhesive containing conductive particles (title and abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the combination of sealing material and conductive material as a sealing material to make a narrow picture frame outside the display area even for active matrix liquid crystal display devices with many complicated wiring.

11. Following is the response by the Examiner to the applicant's arguments:

(a) Applicant's argument No. 1 (Page 7, lines 11-15): Tsuda teaches spacers (7)..... which is 5 to 20% larger than a diameter of the spacers as claimed.

Examiner's response to argument No.1: As the applicant pointed out, 'Tsuda teaches spacers (7) have an outside diameter of 5 to 10 micrometers and conductive members (6) having an outside diameter of 5 to 10 micrometers' does NOT necessarily make them equal. It is conceivable that the ranges specified could be such that the outside diameter of the spacer is anywhere between 5 to 10 micrometers and likewise, the outside diameter of the conductive member could be anywhere between 5 to 10 micrometers. Thus the possibility of the spacer having a diameter of 5 micrometer and the conductive member having a diameter between 5.25 and 6 micrometers exists, which certainly falls with in the range of 5 to 205 larger as recited in the claims. Besides, in Fig. 1, Tsuda does show that the conductive member (6) is slightly larger than the spacer (7).

For the rest of the arguments, please see the above reasons for rejection.

Art Unit: 2871

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 703-305-4767. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0530.

PRR

May 29, 2003

[Handwritten Signature]
SUPERVISOR
TELEPHONE NUMBER 703-305-3492